

**EXPRESS TERMS
FOR
PROPOSED BUILDING STANDARDS
OF THE
DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
REGARDING THE ADOPTION BY REFERENCE OF THE
2006 INTERNATIONAL BUILDING CODE (IBC) WITH PROPOSED AMENDMENTS INTO THE
2007 CALIFORNIA BUILDING CODE (CBC)
CALIFORNIA CODE OF REGULATIONS, TITLE 24, PART 2**

The Department of Housing and Community Development (HCD) proposes to adopt the 2006 edition of the International Building Code (IBC)] for codification and effectiveness into the 2007 edition of the California Building Code (CBC) as presented on the following pages, including any necessary amendments. HCD further proposes to:

- Repeal the 2001 edition of the California Building Code;
- Repeal amendments to the model codes that are no longer necessary, repeal or amend building standards that are not addressed by a model code;
- Relocate or codify existing adopted and necessary amendments to the model code into the format of the model code proposed for adoption, the action of which has no regulatory effect; adopt new necessary amendments to the model code proposed for adoption; and/or
- Adopt new building standards that are not addressed by the model code proposed for adoption

LEGEND FOR EXPRESS TERMS:

1. Existing California amendments or code language being modified: All such language appears in *italics*, modified language is underlined or in ~~strikeout~~.
 2. New California amendments: All such language appears *underlined and in italics*.
 3. Repealed text: All such language appears in ~~strikeout~~.
 4. Notation: Authority and Reference citations are provided at the end of each chapter.
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SPECIAL NOTE: THIS RULEMAKING IS DIVIDED INTO FOUR ITEMS: ITEM #1: STRUCTURAL STANDARDS; ITEM #2: NON-STRUCTURAL STANDARDS; ITEM #3: ACCESSIBILITY STANDARDS; ITEM #4. STRAWBALE STANDARDS

ITEM #1: STRUCTURAL STANDARDS
[Chapters 5 - 7, 9, 14 - 23]

CHAPTER 5

GENERAL BUILDING HEIGHTS AND AREAS

(Note: Adopt only those Sections listed in the matrix adoption table.)

502.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this Code, have the meanings shown herein.

GRADE PLANE. A reference plane representing the average of finished ground level adjoining the building at exterior walls. Where the finished ground level slopes away from the exterior walls, the reference plane shall be established by the lowest points within the area between the building and the lot line or, where the lot line is more than 6 feet (1829 mm) from the building, between the building and a point 6 feet (1829mm) from the building.

(Section 208-G, 2001 CBC) ~~[For HCD-1 and HCD-2]~~ For applications listed in Section 108.2.1.2 regulated by the Department of Housing and Community Development. "GRADE OR GRADEPLANE" is the lowest point of elevation of the finished surface of the ground, paving or sidewalk within the area between the building and the property line or, when the property line is more than 5 feet (1524 mm) from the building, between the building and a line 5 feet (1524 mm) from the building. For additional information, see Health and Safety Code Section 19955.3 (d).

503.1 General. The height and area for buildings of different construction types shall be governed by the intended use of the building and shall not exceed the limits in Table 503 except as modified hereafter. Each part of a building included within the exterior walls or the exterior walls and fire walls where provided shall be permitted to be a separate building.

(Section 310.2.1, 2001 CBC) **Exception:** ~~[For HCD-1]~~ Limited-density owner-built rural dwellings may be of any type of construction which will provide for a sound structural condition. Structural hazards which result in an unsound condition and which may constitute a substandard building are delineated by Section 17920.3 of the Health and Safety Code.

NOTE:

Authority: Health and Safety Code Sections 17040, 17921, 17922, 18300, 18865 and 19990; and Government Code Sections 12955.1 and 12955.1.1.

Reference: Health and Safety Code Sections 17000 through 17060, 17910 through 17990, 18620, 18630, 18640, 18670, 18690, 18691, 18873 through 18873.5 and 19960 through 19997; and Government Code Sections 12955.1 and 12955.1.1.

CHAPTER 6

TYPES OF CONSTRUCTION

(Note: Adopt entire chapter with amendments.)

TABLE 602 FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE^{a, e}

FIRE SEPARATION DISTANCE = X (feet)	TYPE OF CONSTRUCTION	OCCUPANCY GROUP H	OCCUPANCY GROUP F-1, M, S-1	OCCUPANCY GROUP A, B, E, F-2, I, R ^f , S-2, U ^{b,f}
X < 5 ^c	All	3	2	1
5 ≤ X < 10	IA	3	2	1
	Others	2	1	1
10 ≤ X < 30	IA, IB	2	1	1 ^d
	IIB, VB	1	0	0
	Others	1	1	1 ^d
X ≥ 30	All	0	0	0

For SI: 1 foot = 304.8 mm.

- Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.
- For special requirements for Group U occupancies see Section 406.1.2
- See Section 705.1.1 for party walls.
- Open parking garages complying with Section 406 shall not be required to have a fire-resistance rating.
- The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.

f. Group R-3 and Group U when used as accessory to Group R-3 shall not be required to have a fire-resistance rating where the fire separation distance is 3 feet or more.

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or Type II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. Fire-retardant-treated wood shall be permitted in:
 - 1.1. Nonbearing partitions where the required fire-resistance rating is 2 hours or less.
 - 1.2. Nonbearing exterior walls where no fire rating is required.
 - 1.3. Roof construction, including girders, trusses, framing and decking.

Exception: In buildings of Type I construction exceeding two stories in height, fire-retardant-treated wood is not permitted in roof construction when the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).

2. Thermal and acoustical insulation, other than foam plastics, having a flame spread index of not more than 25.

Exceptions:

1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a flame spread index of not more than 100.
2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a flame spread index of not more than 200.
3. Foam plastics in accordance with Chapter 26.
4. Roof coverings that have an A, B or C classification.
5. Interior floor finish and interior finish, trim and millwork such as doors, door frames, window sashes and frames.
6. Where not installed over 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
7. Finished flooring applied directly to the floor slab or to wood sleepers that are fireblocked in accordance with Section 717.2.7.
8. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a corridor serving an occupant load of 30 or more shall be permitted to be constructed of fire-retardant-treated wood, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
9. Stages and platforms constructed in accordance with Sections 410.3 and 410.4, respectively.
10. Combustible exterior wall coverings, balconies and similar projections and bay or oriel windows in accordance with Chapter 14.
11. Blocking such as for handrails, millwork, cabinets and window and door frames.
12. Light-transmitting plastics as permitted by Chapter 26.
13. Mastics and caulking materials applied to provide flexible seals between components of exterior wall construction.
14. Exterior plastic veneer installed in accordance with Section 2605.2.
15. Nailing or furring strips as permitted by Section 803.4.
16. Heavy timber as permitted by Note d to Table 601 and Sections 602.4.7 and 1406.3.
17. Aggregates, component materials and admixtures as permitted by Section 703.2.2.
18. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of fire-resistance tests in accordance with Section 703.2 and installed in accordance with Section 1704.10 and 1704.11, respectively.
19. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 712.
20. Materials used to protect joints in fire-resistance-rated assemblies in accordance with Section 713.
21. Materials allowed in the concealed spaces of buildings of Type I and II construction in accordance with Section 717.5.
22. Materials exposed within plenums complying with Section 602 of the International California Mechanical Code.

603.1.1 Ducts. The use of nonmetallic ducts shall be permitted when installed in accordance with the limitations of the International California Mechanical Code.

603.1.2 Piping. The use of combustible piping materials shall be permitted when installed in accordance with the limitations of the International California Mechanical Code and the International California Plumbing Code.

603.1.3 Electrical. The use of electrical wiring methods with combustible insulation, tubing, raceways and related components shall be permitted when installed in accordance with the limitations of the ~~ICC~~ California *Electrical Code*.

NOTE:

Authority: Health and Safety Code Sections 17040, 17921, 17922, 18300, 18865 and 19990; and Government Code Sections 12955.1 and 12955.1.1.

Reference: Health and Safety Code Sections 17000 through 17060, 17910 through 17990, 18620, 18630, 18640, 18670, 18690, 18691, 18873 through 18873.5 and 19960 through 19997; and Government Code Sections 12955.1 and 12955.1.1.

CHAPTER 7

FIRE-RESISTANCE-RATED CONSTRUCTION

(Note: Adopt only those Sections listed in the matrix adoption table.)

707.2 Shaft enclosure required. Openings through a floor/ceiling assembly shall be protected by a shaft enclosure complying with this Section.

Exceptions:

1. A shaft enclosure is not required for openings totally within an individual residential dwelling unit and connecting four stories or less.
2. A shaft enclosure is not required in a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 for an escalator opening or stairway that is not a portion of the means of egress protected according to Item 2.1 or 2.2:
 - 2.1. Where the area of the floor opening between stories does not exceed twice the horizontal projected area of the escalator or stairway and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Groups B and M, this application is limited to openings that do not connect more than four stories.
 - 2.2. Where the opening is protected by approved power-operated automatic shutters at every penetrated floor. The shutters shall be of noncombustible construction and have a fire-resistance rating of not less than 1.5 hours. The shutter shall be so constructed as to close immediately upon the actuation of a smoke detector installed in accordance with Section 907.11 and shall completely shut off the well opening. Escalators shall cease operation when the shutter begins to close. The shutter shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) and shall be equipped with a sensitive leading edge to arrest its progress where in contact with any obstacle, and to continue its progress on release therefrom.
3. A shaft enclosure is not required for penetrations by pipe, tube, conduit, wire, cable and vents protected in accordance with Section 712.4.
4. A shaft enclosure is not required for penetrations by ducts protected in accordance with Section 712.4. Grease ducts shall be protected in accordance with the ~~International~~ California Mechanical Code.
5. In other than Group H occupancies, a shaft enclosure is not required for floor openings complying with the provisions for atriums in Section 404.
6. A shaft enclosure is not required for approved masonry chimneys where annular space protection is provided at each floor level in accordance with Section 717.2.5.
7. In other than Groups I-2 and I-3, a shaft enclosure is not required for a floor opening or an air transfer opening that complies with the following:

- 7.1. Does not connect more than two stories.
- 7.2. Is not part of the required means of egress system, except as permitted in Section 1020.1.
- 7.3. Is not concealed within the building construction.
- 7.4. Is not open to a corridor in Group I and R occupancies.
- 7.5. Is not open to a corridor on nonsprinklered floors in any occupancy.
- 7.6. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.
- 7.7. Is limited to the same smoke compartment.
- 8. A shaft enclosure is not required for automobile ramps in open and enclosed parking garages constructed in accordance with Sections 406.3 and 406.4, respectively.
- 9. A shaft enclosure is not required for floor openings between a mezzanine and the floor below.
- 10. A shaft enclosure is not required for joints protected by a fire-resistant joint system in accordance with Section 713.
- 11. A shaft enclosure shall not be required for floor openings created by unenclosed stairs or ramps in accordance with Exception 8 or 9 in Section 1020.1.
- 12. Floor openings protected by floor fire doors in accordance with Section 711.8.
- 13. Where permitted by other Sections of this Code.

708.3 Fire-resistance rating. Fire partitions shall have a fire-resistance rating of not less than 1 hour.

Exceptions:

- 1. Corridor walls as permitted by Table 1017.1.
- 2. Dwelling and sleeping unit separations in buildings of Type IIB, IIIB and VB construction shall have fire-resistance ratings of not less than 1/2hour in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
- 3. A common 2-hour fire-resistance-rated wall is permitted for townhouses if such walls do not contain plumbing or mechanical equipment, ducts or vents in the cavity of the common wall. Electrical installations shall be installed in accordance with the California Electrical Code. Penetrations of electrical outlet boxes shall be in accordance with Section 712.

708.4 Continuity. Fire partitions shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above or to the fire-resistance-rated floor/ceiling or roof/ceiling assembly above, and shall be securely attached thereto. If the partitions are not continuous to the sheathing, deck or slab, and where constructed of combustible construction, the space between the ceiling and the sheathing, deck or slab above shall be fireblocked or draftstopped in accordance with Sections 717.2 and 717.3 at the partition line. The supporting construction shall be protected to afford the required fire-resistance rating of the wall supported, except for tenant and sleeping unit separation walls and corridor walls in buildings of Types IIB, IIIB and VB construction.

Exceptions:

- 1. The wall need not be extended into the crawl space below where the floor above the crawl space has a minimum 1-hour fire-resistance rating.
- 2. Where the room-side fire-resistance-rated membrane of the corridor is carried through to the underside of the floor or roof sheathing, deck or slab of a fire-resistance-rated floor or roof above, the ceiling of the corridor

shall be permitted to be protected by the use of ceiling materials as required for a 1-hour fire-resistance-rated floor or roof system.

3. Where the corridor ceiling is constructed as required for the corridor walls, the walls shall be permitted to terminate at the upper membrane of such ceiling assembly.

4. The fire partition separating tenant spaces in a mall, complying with Section 402.7.2, are not required to extend beyond the underside of a ceiling that is not part of a fire-resistance-rated assembly. A wall is not required in attic or ceiling spaces above tenant separation walls.

5. Fireblocking or draftstopping is not required at the partition line in Group R-2 buildings that do not exceed four stories in height, provided the attic space is subdivided by draftstopping into areas not exceeding 3,000 square feet (279 m²) or above every two dwelling units, whichever is smaller.

6. Fireblocking or draftstopping is not required at the partition line in buildings equipped with an automatic sprinkler system installed throughout in accordance with Section 903.3.1.1 or 903.3.1.2, provided that automatic sprinklers are installed in combustible floor/ceiling and roof/ceiling spaces.

7. Wall assemblies in two-family dwellings need not extend through attic spaces when the ceiling is protected by not less than $\frac{5}{8}$ -inch (15.9 mm) Type X gypsum board and an attic draft stop constructed as specified in Section 717.3.1 is provided above and along the wall assembly separating the dwellings. The structural framing supporting the ceiling shall also be protected by not less than $\frac{1}{2}$ -inch (12.7 mm) gypsum board or equivalent.

708.8 Joints. Joints made in or between fire partitions shall comply with Section 713.

Exception: Fire-resistance-rated wall assemblies in two-family dwellings which extend to and are tight against the exterior wall, the ceiling as permitted in Section 708.4, or the underside of the roof sheathing.

716.5.4 Fire partitions. Ducts and air transfer openings that penetrate fire partitions shall be protected with listed fire dampers installed in accordance with their listing.

Exceptions: In occupancies other than Group H, fire dampers are not required where any of the following apply:

1. The partitions are tenant separation or corridor walls in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and the duct is protected as a through penetration in accordance with Section 712.

2. Tenant partitions in covered mall buildings where the walls are not required by provisions elsewhere in the Code to extend to the underside of the floor or roof deck above.

3. The duct system is constructed of approved materials in accordance with the ~~International~~ California Mechanical Code and the duct penetrating the wall complies with all of the following requirements:

3.1. The duct shall not exceed 100 square inches (0.06 m²).

3.2. The duct shall be constructed of steel a minimum of 0.0217 inch (0.55 mm) in thickness.

3.3. The duct shall not have openings that communicate the corridor with adjacent spaces or rooms.

3.4. The duct shall be installed above a ceiling.

3.5. The duct shall not terminate at a wall register in the fire-resistance-rated wall.

3.6. A minimum 12-inch-long (305 mm) by 0.060-inch-thick (1.52 mm) steel sleeve shall be centered in each duct opening. The sleeve shall be secured to both sides of the wall and all four sides of the sleeve with minimum $1\frac{1}{2}$ -inch by $1\frac{1}{2}$ -inch by 0.060-inch (38 mm by 38 mm by 1.52 mm) steel retaining angles. The retaining angles shall be secured to the sleeve and the wall with No. 10 (M5) screws. The annular space between the steel sleeve and the wall opening shall be filled with mineral wool batting on all sides.

716.6.1 Through penetrations. In occupancies other than Groups I-2 and I-3, a duct constructed of approved materials in accordance with the *International California Mechanical Code* that penetrates a fire-resistance-rated floor/ceiling assembly that connects not more than two stories is permitted without shaft enclosure protection, provided a listed fire damper is installed at the floor line or the duct is protected in accordance with Section 712.4. For air transfer openings, see Exception 7 to Section 707.2.

Exception: A duct is permitted to penetrate three floors or less without a fire damper at each floor, provided it meets all of the following requirements:

1. The duct shall be contained and located within the cavity of a wall and shall be constructed of steel not less than 0.019 inch (0.48 mm) (26 gage) in thickness.
2. The duct shall open into only one dwelling or sleeping unit and the duct system shall be continuous from the unit to the exterior of the building.
3. The duct shall not exceed 4-inch (102 mm) nominal diameter and the total area of such ducts shall not exceed 100 square inches (0.065 m²) in any 100 square feet (9.3 m²) of floor area.
4. The annular space around the duct is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 time-temperature conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the fire-resistance rating of the construction penetrated.
5. Grille openings located in a ceiling of a fire-resistance-rated floor/ceiling or roof/ceiling assembly shall be protected with a listed ceiling radiation damper installed in accordance with Section 716.6.2.1.

716.6.2 Membrane penetrations. Ducts and air transfer openings constructed of approved materials in accordance with the *International California Mechanical Code* that penetrate the ceiling membrane of a fire-resistance-rated floor/ceiling or roof/ceiling assembly shall be protected with one of the following:

1. A shaft enclosure in accordance with Section 707.
2. A listed ceiling radiation damper installed at the ceiling line where a duct penetrates the ceiling of a fire-resistance-rated floor/ceiling or roof/ceiling assembly.
3. A listed ceiling radiation damper installed at the ceiling line where a diffuser with no duct attached penetrates the ceiling of a fire-resistance-rated floor/ceiling or roof/ceiling assembly.

716.6.3 Nonfire-resistance-rated floor assemblies. Duct systems constructed of approved materials in accordance with the *International California Mechanical Code* that penetrate nonfire-resistance-rated floor assemblies shall be protected by any of the following methods:

1. A shaft enclosure in accordance with Section 707.
2. The duct connects not more than two stories, the annular space around the penetrating duct is protected with an approved noncombustible material that resists the free passage of flame and the products of combustion.
3. The duct connects not more than three stories, the annular space around the penetrating duct is protected with an approved noncombustible material that resists the free passage of flame and the products of combustion and a fire damper is installed at each floor line.

Exception: Fire dampers are not required in ducts within individual residential dwelling units.

717.5 Combustible materials in concealed spaces in Type I or II construction. Combustible materials shall not be permitted in concealed spaces of buildings of Type I or II construction.

Exceptions:

1. Combustible materials in accordance with Section 603.

2. Combustible materials exposed within plenums complying with Section 602 of the ~~International~~ California Mechanical Code.
3. Class A interior finish materials classified in accordance with Section 803.
4. Combustible piping within partitions or shaft enclosures installed in accordance with the provisions of this Code.
5. Combustible piping within concealed ceiling spaces installed in accordance with the ~~International~~ California Mechanical Code and the ~~International~~ California Plumbing Code.
6. Combustible insulation and covering on pipe and tubing, installed in concealed spaces other than plenums, complying with Section 719.7.

719.1 General. Insulating materials, including facings such as vapor retarders and vapor-permeable membranes, similar coverings, and all layers of single and multilayer reflective foil insulations, shall comply with the requirements of this Section. Where a flame spread index or a smoke-developed index is specified in this Section, such index shall be determined in accordance with ASTM E 84. Any material that is subject to an increase in flame spread index or smoke-developed index beyond the limits herein established through the effects of age, moisture, or other atmospheric conditions shall not be permitted.

Exceptions:

1. Fiberboard insulation shall comply with Chapter 23.
2. Foam plastic insulation shall comply with Chapter 26.
3. Duct and pipe insulation and duct and pipe coverings and linings in plenums shall comply with the ~~International~~ California Mechanical Code.

719.7 Insulation and covering on pipe and tubing. Insulation and covering on pipe and tubing shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450.

Exception: Insulation and covering on pipe and tubing installed in plenums shall comply with the ~~International~~ California Mechanical Code.

~~703.5~~ 720.2.5 [For HCD 1 & 2] Cellular Concrete.

~~703.5.1~~ 720.2.5.1 [For HCD 1 & 2] Use and application. Controlled-density cellular concrete, when used or applied, shall be in accordance with the use of materials in Bulletin No. 65 of the Federal Housing Administration, United States Department of Housing and Urban Development.

EXCEPTIONS:

1. Regardless of the provisions of Subsections 3.2, 3.3, 3.4 and 3.6 in Section 3, Bulletin No. 65 provisions relating to proportioning, mixing and testing, in the following shall apply to this chapter.
 - 1.1 Field-control weighings for control of the wet-unit weight shall be made. The design wet-unit weight for field control of the concrete shall be based on previously established data for the relation between the wet-unit weight and the air-dry unit weight at 28 days for the mix being placed. Field-control weighings for determining the wet-unit weight shall be made at the mixer discharge and at the point of deposit. There should be one pair of weighings per batch for batch-type mixers unless equipment is provided with scales allowing the operator to adequately weigh materials. For continuous weight-instrumented batch mixers, there should be one pair of weighings per 10 cubic yards (7.65 m³). The gain in unit weight between the mixer discharge and point of deposit shall not exceed 5 percent. The wet-unit weight at the point of deposit of the concrete shall not exceed plus 5 percent of the design wet-unit weight. A variation exceeding plus 5 percent of the design wet-unit weight shall require a modification of the mix proportions, a change of materials, or a change in the mixing procedure.
 - 1.2 When tests are required by the enforcing agency, they shall be performed in the following manner: Two test cylinders, for compressive strength tests, shall be made for each 8,000 square

feet (743 m²) of surface area placed. A minimum of two test cylinders shall be made each day. Each strength test result shall be the average of two cylinders from the same sample tested at 28 days or at a specified earlier date.

1.3 The minimum air-dry density shall be 90 pounds per cubic foot (1,440 kg/m³). The minimum design compressive strength shall be 1,000 psi (6890 kPa) when the curing procedure specified herein is applied. The minimum design compressive strength shall be 1,250 psi (8,619 kPa) if the slab is placed in a covered area of a building and a specified curing medium is not applied. The specified design compressive strength shall be increased 20 percent when the specified strength is greater than 1,000 psi (6,890 kPa) and the slab is placed in a covered area of a building and a specified curing medium is not applied.

1.4 The cellular concrete shall be sampled at the point of deposit in accordance with the applicable procedures of ASTM C 172, Sampling Fresh Concrete. Cylinder molds shall be either 3 inches by 6 inches (76 mm by 152 mm) or 6 inches by 12 inches (152 mm by 305 mm). Lightly tap the sides of the mold with a rubber hammer while filling the mold instead of rodding the mix. Moist cure the specimens for seven days at 73.4° F (40.8° C) plus or minus 3° F (1.7° C). At the age of seven days, remove the specimens from the moist condition and store in a temperature of 73.4° F (40.8° C) plus or minus 3° F (1.7° C) and a relative humidity of 50 plus or minus 10 percent for 21 days, remove and air dry until the time of test at 28 days. The compressive strength test shall be in accordance with ASTM C 39, Compressive Strength of Cylindrical Concrete Specimens. Determine the air-dry unit weight at 28 days.

2. Regardless of the provisions of Subsections 4.1 and 4.2 in Section 4, of Bulletin No. 65, relating to placing, finishing and curing, the following shall apply to these regulations:

2.1 The concrete shall be placed, finished and cured to produce a level, smooth surface. The concrete shall be placed in a single layer to a minimum thickness of 1 1/2 inches (38 mm). The deviation from a plan shall not exceed 1/4 inch (6 mm) in any 10 feet (3,048 mm). The final finish of the concrete shall be suitable for the application of the specified wear-resistant covering. Cracks wider than 1/8 inch (3 mm) shall be repaired.

2.2 Install a water-resistant membrane between wood or plywood subfloors and the cellular concrete to prevent leakage of the concrete and wetting of the subfloor. The membrane shall consist of waterproof paper or plastic sheets conforming to ASTM C 171, Sheet Materials for Curing Concrete, or Type 15 roofing felt conforming to ASTM D 226, D 250 or D 227, or Federal Specification UUB790, Building Paper Vegetable Fiber: (Kraft, Waterproofed, Water Repellent and Fire-resistant) Type 1, Grade B. The sheets shall be securely fastened to the subfloor.

3. Regardless of the provisions of Subsections 6.1 and 6.2 in Section 6, in Bulletin No. 65, relating to applicator qualifications and warranty, ~~in~~ these subsections are omitted from this chapter.

NOTE:

Authority: Health and Safety Code Sections 17040, 17921, 17922, 18300, 18865 and 19990; and Government Code Sections 12955.1 and 12955.1.1.

Reference: Health and Safety Code Sections 17000 through 17060, 17910 through 17990, 18620, 18630, 18640, 18670, 18690, 18691, 18873 through 18873.5 and 19960 through 19997; and Government Code Sections 12955.1 and 12955.1.1.

CHAPTER 9

FIRE PROTECTION SYSTEMS

(Note: Adopt entire chapter with amendments.)

[F] 903.2.7 Group R. An automatic sprinkler system installed in accordance with Section 903.3 shall be provided throughout all buildings with a Group R fire area.

Exceptions:

1. Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories above grade plane in height with a separate means of egress, unless specifically required by other Sections of this Code or by local ordinance.

2. Group U private garages accessory to a Group R-3 occupancy.

If these exceptions conflict with the requirements of the California Fire Code, these exceptions shall prevail.

903.2.12.1 Ducts conveying hazardous exhausts. Where required by the ~~International~~ California Mechanical Code, automatic sprinklers shall be provided in ducts conveying hazardous exhaust, or flammable or combustible materials.

903.3.5 Water supplies. Water supplies for automatic sprinkler systems shall comply with this Section and the standards referenced in Section 903.3.1. The potable water supply shall be protected against backflow in accordance with the requirements of this Section and the ~~International~~ California Plumbing Code.

904.2.1 Commercial hood and duct systems. Each required commercial kitchen exhaust hood and duct system required by the *International Fire Code* or the ~~International~~ California Mechanical Code to have a Type I hood shall be protected with an approved automatic fire-extinguishing system installed in accordance with this Code.

904.11 Commercial cooking systems. The automatic fire-extinguishing system for commercial cooking systems shall be of a type recognized for protection of commercial cooking equipment and exhaust systems of the type and arrangement protected. Preengineered automatic dry- and wet-chemical extinguishing systems shall be tested in accordance with UL 300 and listed and labeled for the intended application. Other types of automatic fire-extinguishing systems shall be listed and labeled for specific use as protection for commercial cooking operations. The system shall be installed in accordance with this Code, its listing and the manufacturer's installation instructions. Automatic fire-extinguishing systems of the following types shall be installed in accordance with the referenced standard indicated, as follows:

1. Carbon dioxide extinguishing systems, NFPA 12.
2. Automatic sprinkler systems, NFPA 13.
3. Foam-water sprinkler system or foam-water spray systems, NFPA 16.
4. Dry-chemical extinguishing systems, NFPA 17.
5. Wet-chemical extinguishing systems, NFPA 17A.

Exception: Factory-built commercial cooking recirculating systems that are tested in accordance with UL 710B and listed, labeled and installed in accordance with Section 304.1 of the ~~International~~ California Mechanical Code.

908.6 Refrigerant detector. Machinery rooms shall contain a refrigerant detector with an audible and visual alarm. The detector, or a sampling tube that draws air to the detector, shall be located in an area where refrigerant from a leak will concentrate. The alarm shall be actuated at a value not greater than the corresponding TLV-TWA values for the refrigerant classification indicated in the ~~International~~ California Mechanical Code. Detectors and alarms shall be placed in approved locations.

909.1 Scope and purpose. This Section applies to mechanical or passive smoke control systems when they are required by other provisions of this Code. The purpose of this Section is to establish minimum requirements for the design, installation and acceptance testing of smoke control systems that are intended to provide a tenable environment for the evacuation or relocation of occupants. These provisions are not intended for the preservation of contents, the timely restoration of operations or for assistance in fire suppression or overhaul activities. Smoke control systems regulated by this Section serve a different purpose than the smoke- and heat-venting provisions found in Section 910. Mechanical smoke control systems shall not be considered exhaust systems under Chapter 5 of the ~~International~~ California Mechanical Code.

909.10.2 Ducts. Duct materials and joints shall be capable of withstanding the probable temperatures and pressures to which they are exposed as determined in accordance with Section 909.10.1. Ducts shall be constructed and supported in accordance with the ~~International~~ California Mechanical Code. Ducts shall be leak tested to 1.5 times the maximum design pressure in accordance with nationally accepted practices. Measured leakage shall not exceed 5 percent of design flow. Results of such testing shall be a part of the documentation procedure. Ducts shall be supported directly from fire-resistance-rated structural elements of the building by substantial, noncombustible supports.

Exception: Flexible connections (for the purpose of vibration isolation) complying with the ~~International~~ California Mechanical Code, that are constructed of approved fire-resistance-rated materials.

912.5 Backflow protection. The potable water supply to automatic sprinkler and standpipe systems shall be protected against backflow as required by the ~~International~~ California Plumbing Code.

NOTE:

Authority: Health and Safety Code Sections 17040, 17921, 17922, 18300, 18865 and 19990; and Government Code Sections 12955.1 and 12955.1.1.

Reference: Health and Safety Code Sections 17000 through 17060, 17910 through 17990, 18620, 18630, 18640, 18670, 18690, 18691, 18873 through 18873.5 and 19960 through 19997; and Government Code Sections 12955.1 and 12955.1.1.

CHAPTER 14

EXTERIOR WALLS

(Note: Adopt entire chapter without amendments.)

MATRIX ADOPTION TABLE NOTATION:

The ♦ designation indicates that the State Fire Marshal's adoption of this chapter is applicable to structures subject to HCD 1 and HCD 2.

NOTE: Authority: Health and Safety Code Sections 17040, 17921, 17922, 18300, 18865 and 19990; and Government Code Sections 12955.1 and 12955.1.1.

Reference: Health and Safety Code Sections 17000 through 17060, 17910 through 17990, 18620, 18630, 18640, 18670, 18690, 18691, 18873 through 18873.5 and 19960 through 19997; and Government Code Sections 12955.1 and 12955.1.1.

CHAPTER 15

ROOF ASSEMBLIES AND ROOFTOP STRUCTURES

(Note: Adopt entire chapter with amendments.)

MATRIX ADOPTION TABLE NOTATION:

The ♦ designation indicates that the State Fire Marshal's adoption of this chapter is applicable to structures subject to HCD 1 and HCD 2.

1503.4 Roof drainage. Design and installation of roof drainage systems shall comply with the ~~International~~ California Plumbing Code.

NOTE:

Authority: Health and Safety Code Sections 17040, 17921, 17922, 18300, 18865 and 19990; and Government Code Sections 12955.1 and 12955.1.1.

Reference: Health and Safety Code Sections 17000 through 17060, 17910 through 17990, 18620, 18630, 18640, 18670, 18690, 18691, 18873 through 18873.5 and 19960 through 19997; and Government Code Sections 12955.1 and 12955.1.1.

CHAPTER 16

STRUCTURAL DESIGN

(Note: Adopt entire chapter with amendments.)

MATRIX ADOPTION TABLE NOTATION:

The ♦ designation indicates that the State Fire Marshal's adoption of this chapter is applicable to structures subject to HCD 1 and HCD 2.

1607.7 Loads on handrails, guards, grab bars and vehicle barriers. Handrails, guards, grab bars as designed in ICC A117.1 shall comply with Chapter 11A or Chapter 11B as applicable and vehicle barriers shall be designed and constructed to the structural loading conditions set forth in this section.

1607.7.2 Grab bars, shower seats and dressing room bench seats. Grab bars, shower seats and dressing room bench seat systems shall be designed to resist a single concentrated load of 250 pounds (1.11 kN) applied in any direction at any point. For applications listed in Section 108.2.1.2 regulated by the Department of Housing and Community Development, see Chapter 11A, Section 1127A.4. For applications listed in Section 109.1 regulated by the Division of the State Architect/Access Compliance, see Chapter 11A, Section 1127A.4 and Chapter 11B, Section 1115B.7.2 for grab bars.

1613.6.1 Assumption of flexible diaphragm. Add the following text at the end of Section 12.3.1.1 of ASCE 7:

Diaphragms constructed of wood structural panels or untopped steel decking shall also be permitted to be idealized as flexible, provided all of the following conditions are met:

1. Toppings of concrete or similar materials are not placed over wood structural panel diaphragms except for nonstructural toppings no greater than 1½ inches (38 mm) thick.
2. Each line of vertical elements of the lateral-force-resisting system complies with the allowable story drift of Table 12.12-1.
3. Vertical elements of the lateral-force-resisting system are light-framed walls sheathed with wood structural panels rated for shear resistance or steel sheets.
4. Portions of wood structural panel diaphragms that cantilever beyond the vertical elements of the lateral-force-resisting system are designed in accordance with Section 2305.2.5 of the ~~International~~ California Building Code.

NOTE: Authority: Health and Safety Code Sections 17040, 17921, 17922, 18300, 18865 and 19990; and Government Code Sections 12955.1 and 12955.1.1.
Reference: Health and Safety Code Sections 17000 through 17060, 17910 through 17990, 18620, 18630, 18640, 18670, 18690, 18691, 18873 through 18873.5 and 19960 through 19997; and Government Code Sections 12955.1 and 12955.1.1.

CHAPTER 17

STRUCTURAL TESTS AND SPECIAL INSPECTIONS

(Note: Adopt entire chapter with amendments.)

MATRIX ADOPTION TABLE NOTATION:

The ♦ designation indicates that the State Fire Marshal's adoption of this chapter is applicable to structures subject to HCD 1 and HCD 2.

SECTION 1702 DEFINITIONS

APPROVED AGENCY. An agency established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been approved. *For applications listed in Section 108.2.1 regulated by the Department of Housing and Community Development, "APPROVED AGENCY" shall mean "LISTING AGENCY" and "TESTING AGENCY", See Chapter 2 definitions.*

1704.1 General. Where application is made for construction as described in this Section, the owner or the registered design professional in responsible charge acting as the owner's agent shall employ one or more special inspectors to provide inspections during construction on the types of work listed under Section 1704. The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the building official, for inspection of the particular type of construction or operation requiring special inspection. These inspections are in addition to the inspections specified in Section 109.

Exceptions:

1. Special inspections are not required for work of a minor nature or as warranted by conditions in the jurisdiction as approved by the building official.
2. Special inspections are not required for building components unless the design involves the practice of professional engineering or architecture as defined by applicable state statutes and regulations governing the professional registration and certification of engineers or architects.
3. Unless otherwise required by the building official, special inspections are not required for occupancies in Group R-3 ~~as applicable in Section 104.2~~ and occupancies in Group U that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.

1704.1.2.1 [For HCD 1] Factory-Built Housing. 4. *The provisions of Health and Safety Code Division 13, Part 6 and the California Code of Regulations, Title 25, Division 1, Chapter 3, commencing with Section 3000, shall apply to the construction and inspection of Factory-Built Housing as defined in Health and Safety Code Section 19971.*

NOTE:

Authority: Health and Safety Code Sections 17040, 17921, 17922, 18300, 18865 and 19990; and Government Code Sections 12955.1 and 12955.1.1.
Reference: Health and Safety Code Sections 17000 through 17060, 17910 through 17990, 18620, 18630, 18640, 18670, 18690, 18691, 18873 through 18873.5 and 19960 through 19997; and Government Code Sections 12955.1 and 12955.1.1.

CHAPTER 18

SOILS AND FOUNDATIONS

(Note: Adopt entire chapter with amendments.)

1801.2 Design. Allowable bearing pressures, allowable stresses and design formulas provided in this chapter shall be used with the allowable stress design load combinations specified in Section 1605.3. The quality and design of materials used structurally in excavations, footings and foundations shall conform to the requirements specified in Chapters 16, 19, 21, 22 and 23 of this Code. Excavations and fills shall also comply with Chapter 33.

(Section 1802 Exception, 2001 CBC) ~~[For HCD 1]~~ EXCEPTION: *For limited-density owner-built rural dwellings, pier foundations, stone masonry footings and foundations, pressure-treated lumber, poles, or equivalent foundation materials or designs may be used provided that the bearing is sufficient for the purpose intended.*

1802.1 General. Foundation and soils investigations shall be conducted in conformance with Sections 1802.2 through 1802.6. Where required by the building official, the classification and investigation of the soil shall be made by a registered design professional.

1802.1.1 General and where required for applications listed in Section 108.2.1.1 regulated by the Department of Housing and Community Development. *Foundation and soils investigations shall be conducted in conformance with Health and Safety Code Sections 17953 through 17955 as summarized below.*

(Section 1804.1 Note, 2001 CBC)NOTE: ~~[For HCD 1]~~ *Subject to other provisions of law, the applicable Section and subsection of the Health and Safety Code are repeated here for clarity and reads as follows:*

~~Section 17953.~~ 1802.1.1.1 Preliminary soil report. *Each city, county, ~~and~~ or city and county shall enact an ordinance which requires a preliminary soil report, prepared by a civil engineer who is registered by the state. The report shall be based upon adequate test borings or excavations, of every subdivision, where a tentative and final map is required pursuant to Section 66426 of the Government Code.*

The preliminary soil report may be waived if the building department of the city, county or city and county, or other enforcement agency charged with the administration and enforcement of the provisions of this part, shall determine that, due to the knowledge such department has as to the soil qualities of the soil of the subdivision or lot, no preliminary analysis is necessary.

~~Section 17954~~ 1802.1.1.2 Soil investigation by lot, necessity, preparation, and recommendations. *If the preliminary soil report indicates the presence of critically expansive soils or other soil problems which, if not corrected, would lead to structural defects, such ordinance shall require a soil investigation of each lot in the subdivision.*

The soil investigation shall be prepared by a civil engineer who is registered in this state. It shall recommend corrective action which is likely to prevent structural damage to each dwelling proposed to be constructed on the expansive soil.

~~Section 17955~~ 1802.1.1.3 Approval, building permit conditions, appeal. *The building department of each city, county or city and county, or other enforcement agency charged with the administration and enforcement of the provisions of this part, shall approve the soil investigation if it determines that the recommended action is likely to prevent structural damage to each dwelling to be constructed. As a condition to the building permit, the ordinance shall require that the approved recommended action be incorporated in the construction of each dwelling. Appeal from such determination shall be to the local appeals board.*

1807.4.3 Drainage discharge. The floor base and foundation perimeter drain shall discharge by gravity or mechanical means into an approved drainage system that complies with the ~~International~~ California Plumbing Code.

Exception: Where a site is located in well-drained gravel or sand/gravel mixture soils, a dedicated drainage system is not required.

NOTE:

Authority: Health and Safety Code Sections 17040, 17921, 17922, 18300, 18865 and 19990; and Government Code Sections 12955.1 and 12955.1.1.

Reference: Health and Safety Code Sections 17000 through 17060, 17910 through 17990, 18620, 18630, 18640, 18670, 18690, 18691, 18873 through 18873.5 and 19960 through 19997; and Government Code Sections 12955.1 and 12955.1.1.

CHAPTER 19

CONCRETE

(Note: Adopt the entire chapter with amendments.)

1908.1.10 ACI 318, Section 21.10.1.1. Modify ACI 318, Section 21.10.1.1, to read as follows:

21.10.1.1 - Foundations resisting earthquake-induced forces or transferring earthquake-induced forces between a structure and the ground shall comply with the requirements of Section 21.10 and other applicable provisions of ACI 318 *unless modified by Chapter 18 of the ~~International~~ California Building Code.*

1908.1.12 ACI 318, Section 21.12.5. Modify ACI 318, Section 21.12.5, by adding new Section 21.12.5.6 to read as follows:

21.12.5.6 - Columns supporting reactions from discontinuous stiff members, such as walls, shall be designed for the special load combinations in Section 1605.4 of the ~~International~~ California Building Code and shall be provided with transverse reinforcement at the spacing, s_o , as defined in 21.12.5.2 over their full height beneath the level at which the discontinuity occurs. This transverse reinforcement shall be extended above and below the column as required in 21.4.4.5.

NOTE:

Authority: Health and Safety Code Sections 17040, 17921, 17922, 18300, 18865 and 19990; and Government Code Sections 12955.1 and 12955.1.1.

Reference: Health and Safety Code Sections 17000 through 17060, 17910 through 17990, 18620, 18630, 18640, 18670, 18690, 18691, 18873 through 18873.5 and 19960 through 19997; and Government Code Sections 12955.1 and 12955.1.1.

CHAPTER 20

ALUMINUM

(Note: Adopt the entire chapter without amendments.)

NOTE:

Authority: Health and Safety Code Sections 17040, 17921, 17922, 18300, 18865 and 19990; and Government Code Sections 12955.1 and 12955.1.1.

Reference: Health and Safety Code Sections 17000 through 17060, 17910 through 17990, 18620, 18630, 18640, 18670, 18690, 18691, 18873 through 18873.5 and 19960 through 19997; and Government Code Sections 12955.1 and 12955.1.1.

CHAPTER 21

MASONRY

(Note: Adopt the entire chapter with amendments.)

2107.4 ACI 530/ASCE 5/TMS 402, Section 2.1.6, columns. Add the following text to Section 2.1.6:

2.1.6.6 Light-frame construction. Masonry columns used only to support light-frame roofs of carports, porches, sheds or similar structures with a maximum area of 450 square feet (41.8 m²) assigned to Seismic Design Category A, B or C are permitted to be designed and constructed as follows:

1. Concrete masonry materials shall be in accordance with Section 2103.1 of the ~~International~~ California Building Code. Clay or shale masonry units shall be in accordance with Section 2103.2 of the ~~International~~ California Building Code.
2. The nominal cross-Sectional dimension of columns shall not be less than 8 inches (203 mm).
3. Columns shall be reinforced with not less than one No. 4 bar centered in each cell of the column.
4. Columns shall be grouted solid.
5. Columns shall not exceed 12 feet (3658 mm) in height.
6. Roofs shall be anchored to the columns. Such anchorage shall be capable of resisting the design loads specified in Chapter 16 of the ~~International~~ California Building Code.

2113.11.1.2 Gas appliances. Flue lining systems for gas appliances shall be in accordance with the ~~International Fuel Gas~~ California Mechanical Code.

2113.15 Flue area (appliance). Chimney flues shall not be smaller in area than the area of the connector from the appliance. Chimney flues connected to more than one appliance shall not be less than the area of the largest connector plus 50 percent of the areas of additional chimney connectors.

Exceptions:

1. Chimney flues serving oil-fired appliances sized in accordance with NFPA 31.
2. Chimney flues serving gas-fired appliances sized in accordance with the ~~International Fuel Gas~~ California Mechanical Code.

NOTE:

Authority: Health and Safety Code Sections 17040, 17921, 17922, 18300, 18865 and 19990; and Government Code Sections 12955.1 and 12955.1.1.

Reference: Health and Safety Code Sections 17000 through 17060, 17910 through 17990, 18620, 18630, 18640, 18670, 18690, 18691, 18873 through 18873.5 and 19960 through 19997; and Government Code Sections 12955.1 and 12955.1.1.

CHAPTER 22

STEEL

(Note: Adopt the entire chapter without amendments.)

NOTE:

Authority: Health and Safety Code Sections 17040, 17921, 17922, 18300, 18865 and 19990; and Government Code Sections 12955.1 and 12955.1.1.

Reference: Health and Safety Code Sections 17000 through 17060, 17910 through 17990, 18620, 18630, 18640, 18670, 18690, 18691, 18873 through 18873.5 and 19960 through 19997; and Government Code Sections 12955.1 and 12955.1.1.

CHAPTER 23

WOOD

(Note: Adopt the entire chapter with amendments.)

2301.1 Scope. The provisions of this chapter shall govern the materials, design, construction, and quality of wood members and their fasteners.

(Section 2304.2, Exception, 2001 CBC) **EXCEPTION [For HCD 1]:** For limited-density owner-built rural dwellings, owner-produced or used materials and appliances may be utilized unless found not to be of sufficient strength or durability to perform the intended function; owner-produced or used lumber, or shakes and shingles may be utilized unless found to contain dry rot, excessive splitting, or other defects obviously rendering the material unfit in strength or durability for the intended purpose.

2304.5 Framing around flues and chimneys. Combustible framing shall be a minimum of 2 inches (51 mm), but shall not be less than the distance specified in Sections 2111 and 2113 and the ~~International~~ California Mechanical Code, from flues, chimneys and fireplaces, and 6 inches (152 mm) away from flue openings.

2308.1 General. The requirements of this Section are intended for conventional light-frame construction. Other methods are permitted to be used, provided a satisfactory design is submitted showing compliance with other provisions of this Code. Interior nonload-bearing partitions, ceilings and curtain walls of conventional light-frame construction are not subject to the limitations of this Section. Alternatively, compliance with AF&PA WFCM shall be permitted subject to the limitations therein and the limitations of this Code. ~~Detached one- and two-family dwellings and multiple single family dwellings (townhouses) not more than three stories above grade plane in height with a separate means of egress and their accessory structures shall comply with the International Residential Code.~~

2308.2.2 Buildings in Seismic Design Category B, C, D or E. Buildings of conventional light-frame construction in Seismic Design Category B or C, as determined in Section 1613, shall comply with the additional requirements in Section 2308.11.

Exceptions:

1. Detached one- and two-family dwellings in Seismic Design Category B.

2. Detached one- and two-family dwellings in Seismic Design Category C where masonry veneer is limited to the first two stories above grade.

TABLE 2308.9.3(1)
BRACED WALL PANELS^a

SEISMIC DESIGN CATEGORY	CONDITION	CONSTRUCTION METHODS ^{b,c}								BRACED PANEL LOCATION AND LENGTH ^d
		1	2	3	4	5	6	7	8	
A and B	One story, top of two or three story	X	X	X	X	X	X	X	X	Located in accordance with Section 2308.9.3 and not more than 25 feet on center.
	First story of two story or second story of three story	X	X	X	X	X	X	X	X	
	First story of three story	—	X	X	X	X ^e	X	X	X	
C	One story or top of two story <u>or three story</u>	—	X	X	X	X	X	X	X	Located in accordance with Section 2308.9.3 and not more than 25 feet on center.
	First story of two story <u>or second story of three story</u>	—	X	X	X	X ^e	X	X	X	Located in accordance with Section 2308.9.3 and not more than 25 feet on center, but total length shall not be less than 25% of building length ^f .
	First story of three story	—	X	X	X	X ^e	X	X	X	Located in accordance with Section 2308.9.3 and not more than 25 feet on center, but total length shall not be less than 40% of building length ^f .

2308.11 Additional requirements for conventional construction in Seismic Design Category B or C.

Structures of conventional light-frame construction in Seismic Design Category B or C, as determined in Section 1616, shall comply with Sections 2308.11.1 through 2308.11.3, in addition to the provisions of Sections 2308.1 through 2308.10.

2308.11.1 Number of stories. Structures of conventional light-frame construction shall not exceed two stories in height in Seismic Design Category C.

Exception: Detached one- and two-family dwellings are permitted to be three stories in height in Seismic Design Category C.

2308.12 Additional requirements for conventional construction in Seismic Design Category D or E.

Structures of conventional light-frame construction in Seismic Design Category D or E, as determined in Section 1616, shall conform to Sections 2308.12.1 through 2308.12.9, in addition to the requirements for Seismic Design Category B or C in Section 2308.11.

2308.12.1 Number of stories. Structures of conventional light-frame construction shall not exceed one story in height in Seismic Design Category D or E.

Exception: Detached one- and two-family dwellings are permitted to be two stories high in Seismic Design Category D or E.

TABLE 2308.12.4

WALL BRACING IN SEISMIC DESIGN CATEGORIES D AND E

(Minimum Length of Wall Bracing per each 25 Linear Feet of Braced Wall Line^a)

CONDITION	SHEATHING TYPE ^b	$S_{DS} < 0.50$	$0.50 \leq S_{DS} < 0.75$	$0.75 \leq S_{DS} \leq 1.00$	$S_{DS} > 1.00$
One story	G-P ^c	10 feet 8 inches	14 feet 8 inches	18 feet 8 inches	25 feet 0 inches
	S-W	5 feet 4 inches	8 feet 0 inches	9 feet 4 inches	12 feet 0 inches
<u>Story below top story</u>	<u>G-P^{c,d}</u>	<u>18 feet 8 inches^d</u>	<u>NP</u>	<u>NP</u>	<u>NP^e</u>
	<u>S-W^d</u>	<u>10 feet 8 inches^d</u>	<u>13 feet 4 inches^d</u>	<u>17 feet 4 inches^d</u>	<u>21 feet 4 inches^d</u>
<u>Bottom story of three stories</u>	<u>G-P</u>	<u>Conventional construction not permitted; conformance with Section 2301.2, Items 1 or 2 is required.</u>			
	<u>S-W</u>				

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. Minimum length of panel bracing of one face of the wall for S-W sheathing or both faces of the wall for G-P sheathing; h/w ratio shall not exceed 2:1. For S-W panel bracing of the same material on two faces of the wall, the minimum length is permitted to be one-half the tabulated value but the h/w ratio shall not exceed 2:1 and design for uplift is required.

b. G-P = gypsum board, fiberboard, particleboard, lath and plaster or gypsum sheathing boards; S-W = wood structural panels and diagonal wood sheathing. NP = not permitted.

c. Nailing as specified below shall occur at all panel edges at studs, at top and bottom plates and, where occurring, at blocking:

For $1/2$ -inch gypsum board, 5d (0.113 inch diameter) cooler nails at 7 inches on center;

For $5/8$ -inch gypsum board, No. 11 gage (0.120 inch diameter) at 7 inches on center;

For gypsum sheathing board, $1 3/4$ inches long by $7/16$ -inch head, diamond point galvanized nails at 4 inches on center;

For gypsum lath, No. 13 gage (0.092 inch) by $1 1/8$ inches long, $19/64$ -inch head, plasterboard at 5 inches on center;

For Portland cement plaster, No. 11 gage (0.120 inch) by $1 1/2$ inches long, $7/16$ -inch head at 6 inches on center;

For fiberboard and particleboard, No. 11 gage (0.120 inch) by $1 1/2$ inches long, $7/16$ -inch head, galvanized nails at 3 inches on center.

d. Applies to one- and two- family detached dwellings only.

e. Where S_{DS} is greater than 1.0, conventional construction is not permitted.

NOTE:

Authority: Health and Safety Code Sections 17040, 17921, 17922, 18300, 18865 and 19990; and Government Code Sections 12955.1 and 12955.1.1.

Reference: Health and Safety Code Sections 17000 through 17060, 17910 through 17990, 18620, 18630, 18640, 18670, 18690, 18691, 18873 through 18873.5 and 19960 through 19997; and Government Code Sections 12955.1 and 12955.1.1.